

What is claimed is:

1 1. A method for providing quality of service (QoS)-driven channel access within
2 a basic service set (BSS) in a wireless network, the method comprising steps of:
3 determining at a point coordinator (PC) station of the BSS whether at least
4 one of up-stream traffic and side-stream traffic is scheduled to be transmitted from at least
5 one non-PC station in the BSS;
6 determining at the PC station whether at least one transmission opportunity
7 (TO) is available during a contention free period (CFP) of a superframe for transmitting one
8 of up-stream traffic and side-stream traffic in the BSS, the superframe containing the CFP
9 and a contention period (CP);
10 allocating at least one available TO to a selected non-PC having at least one of
11 up-stream traffic and side-stream traffic to transmit; and
12 sending a multipoll frame from the PC station containing information relating
13 to each allocated TO, the multipoll frame identifying each respective allocated TO by a
14 duration time and one of a virtual stream identifier (VSID) and an association identifier
15 (AID).

1 2. The method according to claim 1, wherein the duration time for a TO is a
2 maximum length of time for the TO.

1 3. The method according to claim 1, wherein a first TO begins a short interframe
2 spacing (SIFS) period of time after an end of the multipoll frame.

1 4. The method according to claim 1, wherein the multipoll frame contains
2 information relating to at least two allocated TOs, each successive TO starting after a
3 preceding TO when a duration time associated with the preceding TO expires.

1 5. The method according to claim 1, wherein the multipoll frame contains
2 information relating to at least two allocated TOs,
3 wherein when a data frame that is indicated to be a final data frame is
4 transmitted in a selected TO, a TO that is subsequent to the selected TO begins a short
5 interframe spacing (SIFS) period of time after the preceding station sends the final data
6 frame.

1 6. The method according to claim 5, wherein the TO that is subsequent to the
2 selected TO ends when a duration time associated with the TO that is subsequent to the
3 selected TO ends.

1 7. The method according to claim 6, wherein when the TO that is subsequent to
2 the selected TO is a last TO identified in the multipoll frame, any remaining time is returned

3 for reallocation by the PC station.

1 8. The method according to claim 1, wherein the multipoll frame includes
2 information relating to at least one VSID and the duration time;

3 the method further comprising steps of:

4 receiving the multipoll frame at a non-PC station for which an available TO
5 was allocated; and

6 transmitting from the non-PC station at least one data frame during the TO
7 allocated to the non-PC station, the at least one data frame being associated with the VSID.

1 9. The method according to claim 8, wherein the at least one data frame is part
2 of an up-stream traffic.

1 10. The method according to claim 8, wherein the at least one data frame is part
2 of a side-stream traffic.

1 11. The method according to claim 8, wherein the at least one data frame
2 transmitted by the non-PC station originates from one of a continuous/periodic flow type of
3 traffic source, a discontinuous/bursty flow type of traffic source, and a best-
4 effort/asynchronous traffic source.

1 12. The method according to claim 1, wherein the multipoll frame includes
2 information relating to at least one VSID and the duration time;
3 the method further comprising steps of:
4 receiving the multipoll frame at a non-PC station for which an available TO
5 was allocated; and
6 transmitting from the non-PC station at least one data frame during the TO
7 allocated to the non-PC station, the at least one data frame being associated with a selected
8 VSID that is different from the VSID identified in the multipoll frame, and the at least one
9 data frame being transmitted based on a comparison of a QoS parameter set associated with
10 the selected VSID and a QoS parameter set associated with the VSID identified in the
11 multipoll frame.

1 13. The method according to claim 1, wherein the multipoll frame includes
2 information relating to at least one AID and the duration time;
3 the method further comprising steps of:
4 receiving the multipoll frame at a non-PC station for which an available TO
5 was allocated; and
6 transmitting from the non-PC station at least one data frame during the TO
7 allocated to the non-PC station, the at least one data frame being transmitted based

8 completely on a determination made by a frame scheduling entity (FSE) of the non-PC
9 station.

1 14. The method according to claim 1, wherein the wireless network is a wireless
2 local area network (WLAN).

1 15. A point coordinator (PC) station in a basic service set (BSS) in a wireless
2 network, the PC station comprising:

3 a frame scheduling entity (FSE) determining whether at least one of up-stream
4 traffic and side-stream traffic is scheduled to be transmitted from at least one non-PC station
5 in the BSS, the FSE determining whether at least one transmission opportunity (TO) is
6 available during a contention free period (CFP) of a superframe for transmitting one of up-
7 stream traffic and side-stream traffic in the BSS, the superframe containing the CFP and a
8 contention period (CP), the FSE allocating at least one available TO to a selected non-PC
9 having at least one of up-stream traffic and side-stream traffic to transmit; and

10 a transmitter sending a multipoll frame from the PC station containing
11 information relating to each TO allocated by the FSE, the multipoll frame identifying each
12 respective allocated TO by a duration time and one of a virtual stream identifier (VSID) and
13 an association identifier (AID).

1 16. The PC station according to claim 15, wherein the duration time for a TO is a
2 maximum length of time for the TO.

1 17. The PC station according to claim 15, wherein a first TO begins a short
2 interframe spacing (SIFS) period of time after an end of the multipoll frame.

1 18. The PC station according to claim 15, wherein the multipoll frame contains
2 information relating to at least two allocated TOs, each successive TO starting after a
3 preceding TO when a duration time associated with the preceding TO expires.

1 19. The PC station according to claim 15, wherein the multipoll frame contains
2 information relating to at least two allocated TOs,
3 wherein when a data frame that is indicated to be a final data frame is
4 transmitted in a selected TO, a TO that is subsequent tot the selected TO begins a short
5 interframe spacing (SIFS) period of time after the preceding station sends the final data
6 frame.

1 20. The PC station according to claim 19, wherein the TO that is subsequent to
2 the selected TO ends when a duration time associated with the TO that is subsequent to the
3 selected TO ends.

1 21. The PC station according to claim 15, wherein the multipoll frame includes
2 information relating to at least one VSID and the duration time;

3 the PC station further comprising a non-PC station in the BSS receiving the
4 multipoll frame, the non-PC station being a non-PC station for which an available TO was
5 allocated, the non-PC station transmitting at least one data frame during the TO allocated to
6 the non-PC station.

1 22. The PC station according to claim 21, wherein the at least one data frame is
2 part of an up-stream traffic.

1 23. The PC station according to claim 21, wherein the at least one data frame is
2 part of a side-stream traffic.

1 24. The PC station according to claim 21, wherein the at least one data frame
2 transmitted by the non-PC station originates from one of a continuous/periodic flow type of
3 traffic source, a discontinuous/bursty flow type of traffic source, and a best-
4 effort/asynchronous traffic source.

1 25. The PC station according to claim 15, wherein the multipoll frame includes
2 information relating to at least one VSID and the duration time;
3 the PC station further comprising a non-PC station in the BSS receiving the
4 multipoll frame, the non-PC station being a non-PC station for which an available TO was
5 allocated, the PC station transmitting at least one data frame during the TO allocated to the
6 non-PC station, the at least one data frame being associated with a selected VSID that is
7 different from the VSID identified in the multipoll frame, and the at least one data frame
8 being transmitted based on a comparison of a QoS parameter set associated with the selected
9 VSID and a QoS parameter set associated with the VSID identified in the multipoll frame.

1 26. The PC station according to claim 15, wherein the multipoll frame includes
2 information relating to at least one AID and the duration time;
3 the PC station further comprising a non-PC station in the BSS receiving the
4 multipoll frame, the non-PC station being a non-PC station for which an available TO was
5 allocated, and the non-PC station transmitting from the non-PC station at least one data
6 frame during the TO allocated to the non-PC station, the at least one data frame being
7 transmitted based completely on a determination made by the FSE of the non-PC station..

1 27. The PC station according to claim 15, wherein the wireless network is a
2 wireless local area network (WLAN).